

Alburnoides qanati, a new species of cyprinid fish from southern Iran (Actinopterygii, Cyprinidae)

Brian W. Coad^{1,†}, Nina G. Bogutskaya^{2,‡}

1 Canadian Museum of Nature, Ottawa, Ontario, Canada **2** Zoological Institute, Russian Academy of Sciences, Universitetskaya nab.1, St. Petersburg, Russia

† [urn:lsid:zoobank.org:author:D9BD0CBF-68E5-4F24-AB56-BA5FA8F4D192](https://zoobank.org/D9BD0CBF-68E5-4F24-AB56-BA5FA8F4D192)

‡ [urn:lsid:zoobank.org:author:F6957EF1-366E-484E-BF40-211E17A93A1B](https://zoobank.org/F6957EF1-366E-484E-BF40-211E17A93A1B)

Corresponding author: Brian W. Coad (bcoad@mus-nature.ca)

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Abstract

Alburnoides qanati, **sp. n.** is described from a qanat in the Pulvar River drainage of Fars Province in southern Iran. The new taxon is distinguished from other members of the genus *Alburnoides* by a combination of characters including a scaled ventral keel, (41, 42)43-47(48, 49) lateral line scales to posterior margin of hypurals, 2.5-4.2 pharyngeal teeth, commonly 8½ branched dorsal-fin rays, 10-12½ branched anal-fin rays, 40-41 total vertebrae, and caudal vertebral region equal or slightly longer than an abdominal region (vertebral formulae 20+20 or 20+21).

Keywords

Freshwater fishes, Cyprinidae, *Alburnoides*, new species, Iran

Introduction

Alburnoides bipunctatus (Bloch, 1782) has long been considered a complex species with a number of subspecies found from France through Europe north of the Alps eastwards to the Black, Caspian and Aral Sea basins (e.g. Berg 1949; Bogutskaya and Naseka 2004; Coad 2009). Some of the subspecies were recently given a rank of species, e.g. *A. ohridanus* (Karaman, 1928) and *A. prespensis* (Karaman, 1924) (Kottelat and Freyhof 2007). Formally, the only species hitherto reported from Iran is *Alburnoides bipunc-*

tatus. In Iran, it is widely distributed and is found in the basins of the Caspian Sea, Lake Orumiyeh, Tedzhen River, Kavir, Namak Lake, Esfahan (Zayandeh and Shur rivers), Tigris River, Persian Gulf drainage, and Kor River (see a review in Coad 2009). The taxon in the Caspian Sea basin is often referred to a subspecies, *A. bipunctatus eichwaldii* (De Filippi, 1863), e.g. by Bogutskaya (1997), although some authors consider it to be a full species (Fricke et al. 2007).

A new species is described here from a qanat stream in the valley of the Pulvar River, a tributary of the Kor River. The Kor is the principal river of an endorheic basin in Fars Province, southern Iran. Qanats are artificial irrigation channels that tap groundwater through adits (Coad 1996).

Methods

Counts and measurements follow Hubbs and Lagler (1958). Measurements are to the nearest 0.1 mm. Head length and interorbital width were measured to their bony margins. Fin ray counts separate unbranched and branched rays. The last two branched rays articulated on a single pterygiophore in dorsal and anal fins are noted as “1½”. Mean and standard deviation were calculated without “½”. Counts of radii were made on three scales for each specimen taken from the caudal peduncle above the lateral line and include both primary and secondary radii. Lateral line scales count includes all pierced scales, from the first one just behind the supracleithrum to the posteriormost one at the base of the caudal fin rays (i.e. posterior margin of hypurals) excluding 1 or 2 scales located on the bases of the caudal fin rays. Osteological characters are examined in cleared-and-stained specimens and from radiographs of 918 specimens from 1066 which are listed below.

Abbreviations used: BMNH, Natural History Museum, London; CMNFI, Canadian Museum of Nature, Ottawa; NMW, Naturhistorisches Museum, Wien; SMF, Senckenberg Museum, Frankfurt a. Main; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg; ZMH, Zoologisches Museum und Institut, Universität Hamburg.

The type series is deposited in CMNFI.

Alburnoides qanati sp. n.

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Figs 1-2

Holotype. CMNFI 1977-0509. **Female.** 81.5 mm TL, 65.0 mm SL, Iran, Fars, at source and along stream of a qanat at Naqsh-e Rostam, Pulvar River system, 29°59'30"N, 52°54'00"E, 1660 m altitude, 6 October 1976, coll. Brian W. Coad, Sylvie Coad and John M. Gunn.

Paratypes. CMNFI 1977-0510, 178 specimens, 24.9-72.5 mm SL, 15 males 50.0-72.0 mm SL and 15 females 54.0-72.5 mm SL counted and measured, same data as holotype.



Figure 1. *Alburnoides qanati* sp. n., female holotype, 65.0 mm SL.



Figure 2. *Alburnoides qanati* sp. n., radiograph of a paratype, SL 58 mm SL. Arrow shows first caudal vertebra.

Diagnosis. The species is distinguished by a combination of characters which includes a large eye, the orbit width exceeding both the snout length and the interorbital width, a scaled ventral keel behind the pelvic fins along the abdomen to the anus, commonly 43-47 lateral line scales to posterior margin of hypurals, 2.5-4.2 pharyngeal teeth, commonly $8\frac{1}{2}$ branched dorsal-fin rays, $10-12\frac{1}{2}$ branched anal-fin rays, 40-41 total vertebrae, and the caudal vertebral region equal or longer than the abdominal region (vertebral formulae 20+20 or 20+21).

Description of holotype. A ventral keel between the pelvics and the anal fin is developed but is completely covered by scales. There is a pelvic axillary scale and scales extend over the proximal bases of the anal fin. The lateral line is decurved and only the last few scales are elevated and on the mid-caudal peduncle. Dorsal fin rays are 3 unbranched and $8\frac{1}{2}$ branched, anal fin rays are 3 unbranched and $12\frac{1}{2}$ branched, branched pectoral fin rays are 15, pelvic fin branched rays are 7. The anal-fin origin is behind the posterior end of the dorsal-fin base. Lateral line scales to posterior margin of hypurals number 46, scales above lateral line to dorsal fin origin are 9, scales below lateral line to anal fin origin are 4, scales below lateral line to pelvic fin origin are 4, and total vertebrae are 41 (including 4 Weberian vertebrae and last complex centrum), comprising 20 abdominal and 21 caudal vertebrae.

The upper body profile is straightened while the lower profile is considerably convex. The snout is short and slightly pointed. The mouth is upturned, the tip of the mouth cleft is on a level with the upper margin of the pupil. The body depth enters standard length 3.6 times, head length enters 3.8, predorsal length 2.0, postdorsal length 2.8, caudal peduncle depth 8.6, caudal peduncle length 4.6, length of longest dorsal fin ray 4.4, and length of longest anal fin ray to scale sheath 6.3. Orbit width enters head length 3.2 times, snout length enters 3.3, and interorbital width 3.3. Pectoral fin length enters pectoral fin origin to pelvic fin origin distance 1.1 times, and pelvic fin length enters pelvic fin origin to anal fin origin distance 1.3 times.

Pigmentation of the holotype in 5% formalin consisted of a dark lateral line dividing the hypaxial and epaxial muscle masses and a weakly developed stripe of black pigment on mid-flank prominent posteriorly on the caudal peduncle but fading over the pectoral fin and often interrupted anteriorly. The lateral line pores were lined by pigment dorsally and ventrally. A mid-dorsal line was apparent before the dorsal fin, weakly developed behind the fin. The fins were mostly hyaline with some black pigment lining the fin rays of the dorsal and caudal fins, the dorsal rays of the pectoral fins and the anterior rays of the anal fin.

Description of paratypes. The following description is based primarily on the 15 males and 15 females listed above.

The body is markedly compressed. The upper body profile is convex or, in larger specimens, slightly to markedly straightened while the lower profile is considerably convex. The ventral keel between the pelvics and anal fin is not sharp and is completely covered by scales in all specimens but four possessing a short scaleless portion of keel (about $\frac{1}{4}$ of keel length) just in front of the anus. The anal-fin origin is behind the posterior end of the dorsal-fin base. The snout is short and slightly pointed. The mouth is terminal to upturned, with the tip of the mouth cleft on a level from slightly above the middle of the eye to the upper margin of the pupil. The mouth cleft is always turned upward, never horizontal, the lower jaw slightly to moderately projecting relative to the upper jaw, and the junction of the lower jaw and the quadrate is on about a vertical through the anterior eye margin.

Body depth enters standard length 3.3-3.9 times (mean 3.6, standard deviation 0.14), predorsal length 1.8-2.3 (2.0, 0.09), postdorsal length 2.6-3.1 (2.8, 0.12), caudal peduncle depth 7.9-9.4 (8.7, 0.36), caudal peduncle length 4.0-5.3 (4.5, 0.28), length of longest dorsal fin ray 3.9-5.1 (4.4, 0.27), and length of longest anal fin ray to scale sheath 5.6-6.7 (6.3, 0.30). Orbit width enters head length 2.9-3.5 (3.2, 0.14) times, snout length 3.1-4.0 (3.5, 0.17), and interorbital width 3.0-3.8 (3.4, 0.18).

Head length is longer in males than in females ($p < 0.05 > 0.025$), in standard length for males 3.3-3.9 (3.6, 0.17) and for females 3.5-3.9 (3.8, 0.11). Pectoral fin length and pelvic fin length are also longer in males. Pectoral fin enters pectoral fin origin to pelvic fin origin distance for males 0.9-1.1 (1.0, 0.07) and for females 1.0-1.2 (1.1, 0.08), and pelvic fin length enters pelvic fin origin to anal fin origin distance for males 0.9-1.2 (1.1, 0.08) and for females 1.1-1.3 (1.2, 0.06).

Dorsal fin unbranched rays commonly 3, 4 in 3 specimens, dorsal fin branched rays $7\frac{1}{2}$ (3) or $8\frac{1}{2}$ (27) (mean 7.9, standard deviation 0.25), anal fin unbranched rays 3, anal fin branched rays $10\frac{1}{2}$ (3), $11\frac{1}{2}$ (22), $12\frac{1}{2}$ (5) (11.1, 0.49), branched pectoral fin rays 13(4), 14(20) or 15(6) (14.1, 0.58), pelvic fin branched rays 7(30). A pelvic axillary scale is present and the anal fin base is proximally overlain by flank scales. The dorsal fin outer margin is truncate to slightly rounded and the anal fin outer margin is truncate to slightly concave.

The lateral line is complete with none, 1 or 2 unpored scales at the posterior end of the lateral series; lateral line scales to posterior margin of hypurals 41(1), 42(1), 43(5), 44(6), 45(3), 46(7), 47(5) 48(1) or 49(1) (45.0, 1.88); scales above lateral line to dorsal fin origin 9(9), 10(18) or 11(3) (9.8, 0.61), scales below lateral line to pelvic fin origin 3(4), 4(19) or 5(7) (4.1, 0.61), and scales below lateral line to anal fin origin 4(16), 5(13) or 6(1) (4.5, 0.57). Total scale radii 8(1), 9(1), 10(4), 11(8), 12(20), 13(17), 14(16) 15(12), 16(7), 17(3) or 18(1) (13.2, 1.91); scale radii are restricted to the posterior field encroaching laterally, circuli are eccentric and the focus is anteriorly located. Total gill rakers in the outer row on first left arch number 6(4), 7(4), 8(21) or 9(1) (7.6, 0.76); gill rakers are very short and widely spaced, not touching the adjacent raker when appressed. Total vertebrae including 4 Weberian vertebrae and last complex centrum number 40(16) or 41(14) (40.5, 0.51). Abdominal vertebrae (including intermediate ones; precaudal vertebrae auctorum) number 20 (in 28 specimens) or 21(12) (mean 20.1). Predorsal vertebrae (anterior to first dorsal pterygiophore) number 13 (24) or 14 (6) (13.2). Caudal vertebrae number 20 (18) or 21 (12) (20.4). The vertebral formula is 20+20 (16), 20+21 (12) or 21+20 (2). Thus, the caudal vertebral region most commonly (in 93% of examined specimens) is equal to or slightly longer than the abdominal region, the mean difference between abdominal and caudal counts being -0.3. A radiograph of a specimen with a vertebral formula 20+21 is shown in Fig. 2.

Pharyngeal tooth counts are 2.5-4.2 in 10 fish examined with one additional fish being a variant with 2.4-4.0. Teeth are hooked at the tip and not serrated below it. The gut shape is a simple "S" with an occasional specimen showing a slight flexure to the left of the anterior loop. The peritoneum is rarely dark brown but usually is white-grey to light brown with black spots. A postcleithrum bone is present and reduced, or absent, in the pectoral fin skeleton.

The general topography of cephalic sensory canals and numbers of pores is typical of most *Alburnoides*, as described by Bogutskaya (1988). The supraorbital canal is not lengthened in its posterior section and has 7-11, commonly 8-10 pores (9 in 57% of canals; mean 8.8), with 2-4 (3 in 90%) and 5-7 (6 in 73%) canal openings on the nasal and frontal bones, respectively. The infraorbital canal has 10-15 pores (13 in 38%, 12 in 30%; 12.8) with 4 (93%) or 5 canal openings on the first infraorbital. The preopercular-mandibular canal is complete, with 11-17, modally 13-16, pores (14 in 38%; 14.4) with (3)4-6 (5 in 77%) and 7-10 (8 in 62%) canal openings on the dentary and preoperculum, respectively. The supratemporal canal is complete, with (4)5-7 (7 in 54%; 6.20) pores.

Overall colouration is silvery with the bases of the pectoral, pelvic and anal fins pink in life. An orange line parallels the anal fin base and the lateral line, lying midway between the two. The ventral surface of the head between the dentaries may be yellow-orange and similarly coloured spots may be found on either side of the dorsal mid-line extending along the whole body. Faint yellow spots occur in rows along the flanks also.

Pigmentation in preserved fish is as described for the holotype although the lateral stripe is weakly-developed in some specimens, the mid-flank band of spots of black pigment may be variably developed, and the lateral line may be clearly or only faintly edged by pigment.

Etymology. The species is named for the qanat habitat in which it was found, now fast disappearing with the use of pump wells, and in recognition of the contribution to civilization made by the Iranian people through this innovative irrigation technique.

Distribution and habitat. To our knowledge, *Alburnoides qanati* is the southernmost *Alburnoides* species. This species is only found in the internal, endorheic drainage basin of the Kor [Kur] River which terminates in the salt lakes Tashk and Bakhtegan which are variably connected and distinct, with Tashk being the northern basin receiving the Kor River (Fig. 3). The Pulvar [Polvār] River is the principal tributary to the Kor River (the classical Araxes) which rises in the Zagros Mountains. The type series was collected from a small stream which issues from a qanat (Fig. 4) near the archaeological site of Naqsh-e Rostam to the northeast of Persepolis.

The qanat taps groundwater through an adit and is used to irrigate fields flanking the Pulvar River, without the need to raise water from the incised river bed. Qanat streams flow into the nearest watercourse, enabling fish to colonise them. Some are stocked with fish from the nearest natural water body (Coad 1996). This qanat stream at 15.00 hours on 6 October 1976 had clear and colourless water, a temperature of 21°C, pH 6.8, conductivity 0.475 mS, the current was slow to medium, stream width was about 2 m and maximum depth was up to 1 m, the shore was grassy, plant life in the stream consisted of encrusting and submergent types, and the stream bed was gravel and mud. Other species caught in the stream were *Alburnus* cf. *mossulensis*, *Capoeta* cf. *damascina* and *Paracobitis* cf. *malapterura*. *Barbus luteus* is also found here.

Alburnoides qanati sp. n. was also collected from a locality further upriver in the Pulvar River basin (CMNFI 1979-0060, 4, 21.0-35.4 mm SL, Iran, Fars, spring and irrigation channel, 7 km north of Sa'adatabad, 30°06'N, 53°12'E; 18 April 1976; coll. B. W. Coad and S. Coad). This material was not included into the paratypes because of the small size of the individuals.

Comparative remarks. The new species differs from most species of the genus, e.g. *A. bipunctatus* (Bloch, 1782), *A. eichwaldii*, *A. fasciatus* (Nordman, 1840), *A. kubanicus* Berg, 1932, *A. ohridanus*, *A. rossicus* Berg, 1924, *A. smyrnae* Pellegrin, 1927, *Alburnoides* sp. from Amu Darya drainage, *Alburnoides* sp. from Danube drainage, and *Alburnoides* sp. from Eastern Ciscaucasus, by its completely or almost scaled ventral keel (vs. scaleless).

A completely scaled keel is also found in *A. oblongus* Bulgakov, 1926 distributed in the lower reaches of the Syr Darya and *Alburnoides* sp. from Orumiyeh

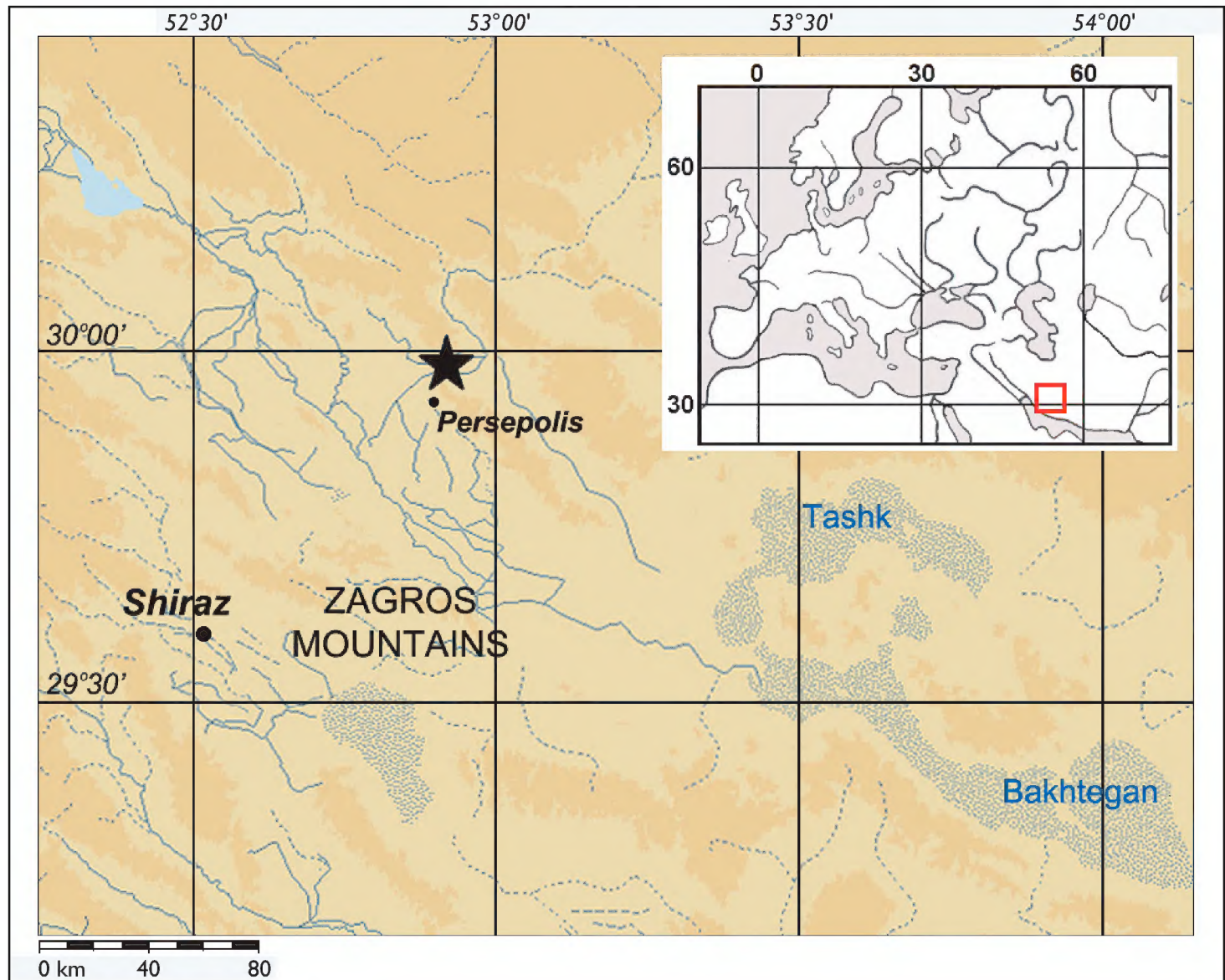


Figure 3. Map showing the type locality of *Alburnoides qanati* sp. n.: Pulvar River system, 29°59'30"N, 52°54'E.

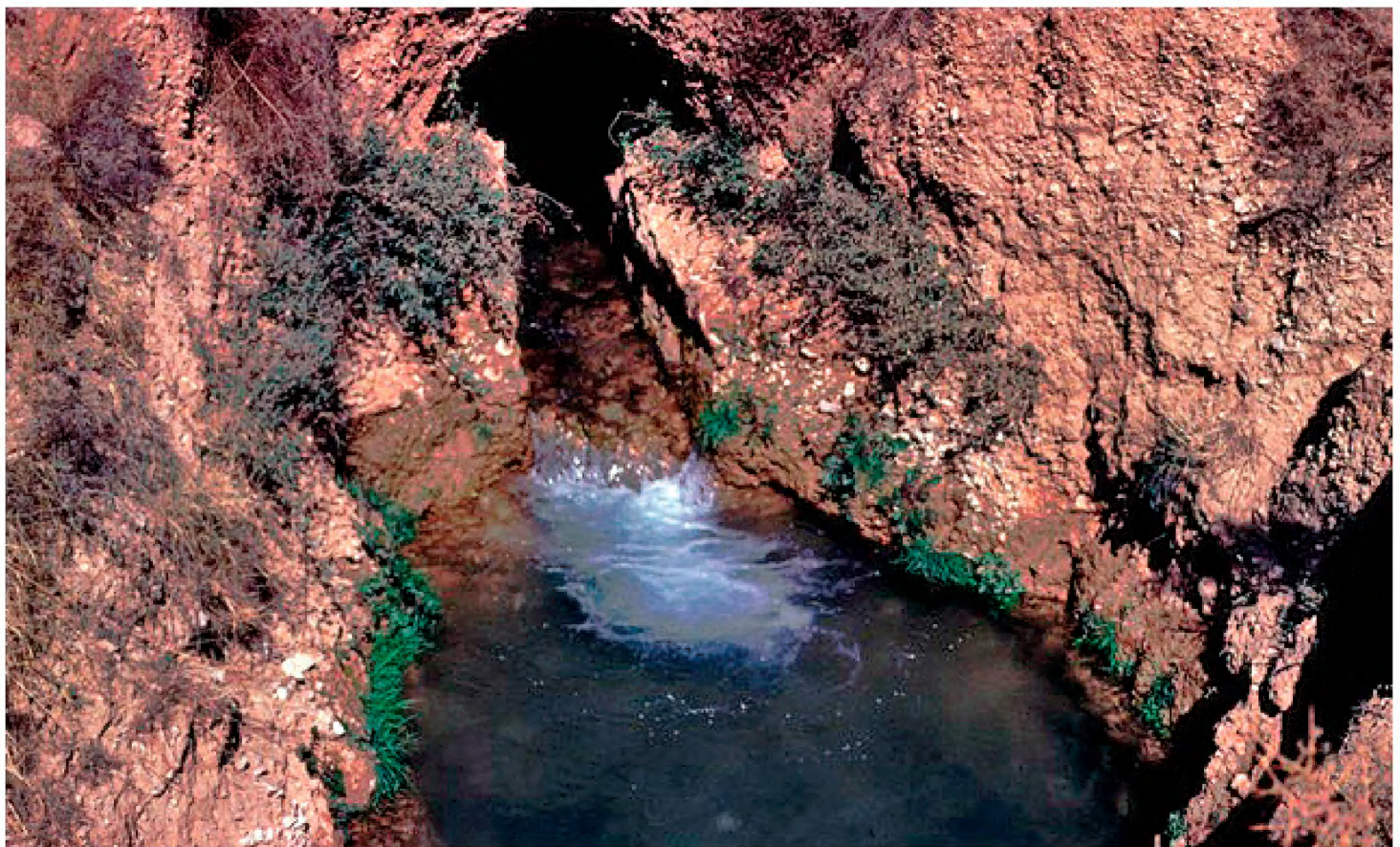


Figure 4. Type locality of *Alburnoides qanati* sp. n., mouth of qanat and stream origin (photo by B.W. Coad).

Lake. *Alburnoides oblongus* also shares with *A. qanati* sp. n. such characters as a low number of anal-fin branched rays (9-11½) and a slightly upturned mouth. However *A. oblongus* is clearly distinguished from the new species by having smaller scales (49-54 lateral line scales to posterior margin of hypurals vs. 41-49), 21+19 or 22+19 vertebrae (vs. commonly 20+20 or 20+21), 2.5-5.2 or 1.5-5.1 pharyngeal teeth (vs. 2.5-4.2), 14-15 predorsal vertebrae (vs. 13-14, usually 13), more numerous gill rakers (10-13 vs. 6-9), a concave margin of the dorsal fin (vs. truncate or rounded), and a rounded anterior part of the anal-fin margin (vs. the whole margin clearly concave). *Alburnoides* sp. from Orumiyeh Lake differs, besides some other characters, by fewer dorsal-fin branched rays (commonly 7½ vs. 8½), fewer anal-fin branched rays (8-10½, commonly 9½, vs. 10-12½, commonly 11½) and 21+19 or 21+20 vertebrae (vs. 20+20 or 20+21) the difference between abdominal and caudal counts averaging +1.4 (vs. -0.3).

The keel is variably scaled in *A. taeniatus* (Kessler, 1874) from Amu and Syr Darya, and two undescribed species of *Alburnoides* from Tigris River system in Iran. *Alburnoides taeniatus* differs from *A. qanati* sp. n. by having larger scales (36-42, commonly 38-40, lateral line scales to posterior margin of hypurals vs. 41-49, commonly 43-47), 2.5-5.2 or 1.5-5.1 pharyngeal teeth (vs. 2.5-4.2), and 19+19, 19+18 or 20+18 vertebrae (vs. 20+20 or 20+21) the difference between abdominal and caudal counts averaging +0.8 (vs. -0.3). Both species from the Tigris as compared to *A. qanati* sp. n. have fewer vertebrae (37-40, averaging 38.9 and 39.0, vs. 40 or 41, averaging 40.5). Geographically close *Alburnoides* sp. from the Namak Lake basin, which is similar to *A. qanati* sp. n. in having commonly 20+20 vertebrae and 10-12½ anal-fin branched rays, is clearly different in having a very sharp scaleless ventral keel (vs. scaled) and fewer predorsal vertebrae (averaging 12.2 vs. 13.2).

Unnamed *Alburnoides* species mentioned above represent to our opinion unnamed distinct species we describe in a separate paper (Bogutskaya and Coad in press), so, we do not provide here their specific names to avoid using them in an unavailable way.

Key to *Alburnoides* species that are known to occur or may occur in Iran

- 1a 15-20 total gill rakers in outer row on first gill arch.
.....*A. taeniatus* [not recorded in Iran but may eventually reach the Caspian Sea basin and the Tedzhen (= Hari) River drainage of Iran from the Tedzhen River and Karakum Canal in Turkmenistan, see Coad (2009)]
- 1b 5-10 total gill rakers in outer row on first gill arch **2**
- 2a Snout pointed or slightly rounded; mouth terminal or upturned, tip of mouth cleft on level from slightly above middle of eye to upper margin of pupil; lower jaw slightly to moderately projecting relative to upper jaw; junction of lower jaw and quadrate on about vertical through anterior eye margin.....
.....*A. qanati* sp. n.

- 2b Snout slightly to markedly rounded; mouth terminal to subterminal, tip of mouth cleft on level from middle of eye to below lower margin of eye; upper jaw slightly to moderately projecting relative to lower jaw; junction of lower jaw and quadrate on about vertical through about middle of eye **3**
- 3a 8-11½, commonly 9-10½, branched anal fin rays; 7½, rarely 8½, branched dorsal fin rays..... **4**
- 3b 10-15½, commonly 11-13½, branched anal fin rays; 8½, rarely 7½, branched dorsal fin rays..... **5**
- 4a Ventral keel completely scaled; 40-41 total vertebrae; 20-22, commonly 21, abdominal vertebrae..... ***Alburnoides* sp.**, Orumiyeh [Urmia] L. basin
- 4b Ventral keel scaleless along from 1/3 to whole keel length; 38-40, commonly 39, total vertebrae; 19-20 abdominal vertebrae
..... ***Alburnoides* sp.** 1, lower Tigris River system.
- 5a Ventral keel smoothed, scaled along 1/3 to whole length
..... ***Alburnoides* sp.** 2, lower Tigris River system.
- 5b Ventral keel well pronounced, almost or completely scaleless **6**
- 6a Lateral line in live and preserved fish delineated by dark pigment dots above and below; 13-15 predorsal vertebrae; mouth terminal, tip of mouth cleft on or slightly below middle of eye..... ***A. eichwaldii***
- 6b Lateral line in live and preserved fish somewhat darker than surrounding flank but no strong dark dots outline canal; 11-13 predorsal vertebrae; mouth almost subterminal, tip of mouth cleft on or below lower margin of eye
..... ***Alburnoides* sp.**, Namak L. basin.

Comparative Material. *Alburnoides bipunctatus*: SMF 20631 (5, Grenzfluss Luxemburg, Rhine drainage).

Alburnoides eichwaldii (all from Eastern Transcaucasia: Kura-Aras river drainage down to Sefid Rud): CMNFI 1979-0695 (30, Sefid Rud). – CMNFI 2007-0090 (14, Zilber R.). – NMW 55516 (2 syntypes, Kura R.). – ZISP 2916 (7, Kura R.). – ZISP 3860 (5, Lenkoran' R.). – ZISP 5188 (10, Childyr [Cildir] L.). – ZISP 9104 (5, Lenkoran' R.). – ZISP 9131 (8, Lenkoran' R.). – ZISP 9136 (5, Geoktapinka R.). – ZISP 10249 (5, Kura R.). – ZISP 25704 (31, Gilyan-chay R.). – ZISP 25713 (26, Gilyan-chay R.). – ZISP 37502 (10 syntypes of *Alburnoides bipunctatus armeniensis*, Marmarik R.). – ZISP 37503 (5, Dzoraget R.). – ZISP 37504 (5, Erer R.). – ZISP 41974 (9, Kura R.). – ZISP uncat. (30, Kura R.). – ZMH 3007-9 (4, Kura R.). – ZMH 3586 (21, Childyr [Cildir] L.). – ZMH 3587-88 (5, Kura R.).

Alburnoides fasciatus (Western Transcaucasia and rivers of the Black Sea coast in Turkey westward to Kizilirmak): NMW 10407-19 (13 syntypes, rivers of eastern Black Sea coast). – ZISP 5296 (6, Rioni R.). – ZISP 11529 (3, Batum). – ZISP 14822 (6, Coruh R.). – ZISP 15157 (4, Kintrishi R.). – ZISP uncat. (35, Otap R.). – ZISP uncat. (25, Kyalasur R.). – ZMH 3585 (8, Kizilirmak R.).

Alburnoides kubanicus (Kuban' R. drainage): ZISP 15306 (8, Laba R.). – ZISP 15307 (8, Kuban R.). – ZISP uncat. (25, Laba R.).

Alburnoides oblongus: BMNH 1975.1.17:249-250 (2, Syr Darya). – ZISP 30696 (1, Badam R.). – ZISP 36725 (3, Angren R.).

Alburnoides ohridanus: ZMH 801 (3, Ohrid L.). – ZMH 1464 (15, Ohrid L.).

Alburnoides rossicus: ZISP 2684 (8, Dnieper R.). – ZISP 5172 (5 syntypes, Shishma R., Kama R. system). – ZISP 10759 (8, Dnieper R.). – ZISP 52813 (26, Vyatka R.).

Alburnoides taeniatus: ZISP 25575 (53, Syr Darya R.).

Alburnoides sp. (Danube River drainage): ZISP 23862 (3), 35710 (4), 35711 (5), 35819 (7), 36852 (10), 37242 (23, Timiș R.), 38329 (10, Argeș R.), ZISP uncat. (25, Sava R.).

Alburnoides sp. (Eastern Ciscaucasia): ZISP 2879 (3, Sunzha R.). – ZISP 10790 (6, Terek R.). – ZISP 14733 (10, Sunzha R.).

Alburnoides sp. (Amu Darya river drainage): ZISP 4491 (2, Zeravshan R.). – ZISP 11050-53 (39, Ashkhabadka R.).

Alburnoides sp. (Namak L. basin): CMNFI 1979-0461A (30). – CMNFI 2007-0121 (2). – CMNFI 2007-0074 (4). – ZMH 4182 (7).

Alburnoides sp. 1 (lower Tigris River system): CMNFI 1979-0281 (42, Simareh River drainage, Lorestan).

Alburnoides sp. 2 (lower Tigris River system): CMNFI 2007-0075 (36, Malayer River, Hamadan), CMNFI 1979-0278 (4, Kashkan River drainage, Lorestan), CMNFI 2007-0115 (8, Qareh Su basin, Kermanshahan), CMNFI 2007-0118 (14, Bid Sorkh River, Kermanshahan).

Alburnoides sp. (Orumiyeh [Urmia] L. basin): CMNFI 1970-0558 (30).

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References

- Berg LS (1949) Freshwater fishes of the U.S.S.R. and adjacent countries, part. 2. Izd. Akad. Nauk SSSR, Moskva-Leningrad, 469-925. [In Russian; translation: Israel Program for Scientific Translations, Jerusalem, 1965].
- Bogutskaya NG (1988) Canal topography of the seismosensory system of cyprinids of the subfamilies Leuciscinae, Xenocyprininae and Cultrinae. Voprosy Ikhtiologii, 28: 367-382 [in Russian; translated in Journal of Ichthyology, 28(4): 91-107].

- Bogutskaya NG (1997) Contribution to the knowledge of leuciscine fishes of Asia Minor. Part 2. An annotated checklist of leuciscine fishes (Leuciscinae, Cyprinidae) of Turkey with descriptions of a new species and two new subspecies. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut* 94: 161-186.
- Bogutskaya NG, Naseka AM (2004) Catalogue of agnathans and fishes of fresh and brackish waters of Russia with comments on nomenclature and taxonomy. KMK Scientific Press Ltd., Moscow, 389 pp. [In Russian].
- Bogutskaya NG, Coad BW (in press). A review of vertebral and fin-ray counts in the genus *Alburnoides* (Teleostei: Cyprinidae) with a description of six new species. *Zoosystematica Rossica*, 18(1).
- Coad BW (1996) Fishes from the *qanats* of Iran. *Publicaciones Especiales Instituto Español de Oceanografía* 21: 63-79.
- Coad BW (2009) Freshwater fishes of Iran. Revised 05 June 2008. <http://www.briancoad.com/Contents.htm> [accessed 05 April 2009]
- Fricke R, Bilecenoglu M, Musa Sari H (2007) Annotated checklist of fish and lamprey species (Gnathostomata and Petromyzontomorphi) of Turkey, including a Red List of threatened and declining species. *Stuttgarter Beitrge zur Naturkunde, Serie A (Biologie)* 706: 1-174.
- Hubbs CL, Lagler KF (1958) *Fishes of the Great Lakes Region*. University of Michigan Press, Ann Arbor, xv + 213 pp.
- Kottelat M, Freyhof J (2007) *Handbook of European freshwater fishes*. Kottelat, Cornol, Switzerland and Freyhof, Berlin, Germany, xiii + 646 pp.